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Car Rental System Using Hybrid Approach

Akash Marbe[1], Tushar ughade[1], Daundkar Siddharth[1], Garade Sakshi[1], Prof. Archana Chalwa[1]

Department of Computer Engineering, Siddhant College of Engineering, Pune India

ABSTRACT: Machine learning algorithms are revolutionizing processes in all fields including; real-estate, security, bioinformatics, and the financial industry. The loan approval process is one of the most tedious tasks in the banking industry. Modern technology such as machine learning models can improve the speed, efficacy, and accuracy of loan approval processes. This paper presents six machine learning algorithms (Random Forest, Gradient Boost, Decision Tree, Support Vector Machine, K-Nearest Neighbor, and Logistic Regression) for predicting loan eligibility. The models were trained on the historical dataset 'Loan Eligible Dataset,' available on Kaggle and licensed under Database Contents License (DbCL) v1.0. The dataset was processed and analyzed using Python programming libraries on Kaggle's Jupyter Notebook cloud environment. Our research result showed high-performance accuracy, with the Random forest algorithm having the highest score of 95.55% and Logistic regression with the lowest score of 80%. Our Models outperformed two of the three loan prediction models found in the literature in terms of precision-recall and accuracy.

KEYWORDS: KNN, SVM, Bagging and Boosting techniques, Efficient ML Algorithms, Loan approval prediction.

I. INTRODUCTION

1.1 OVERVIEW

The Manual car rental system provides services only during office hours. SO; customers have limited time to make any transactions or reservation of the cars. The existence of the online car rental system nowadays has limitations of the business operation hour. However; there is still a few number of these online car rental systems in Malaysia and most of the systems offered reservation service for tourists or traveler. Besides that, there are some customers who faced a problem in choosing car to be rented which suitable with some of the important requirements.

1. To rent a car a prospective renter must first go to the nearest office to register as a client
2. Cars that provide difficulties to rent out are normally advertised in local or national newspaper. it involves a lot of paper work and consumes time.

1.2 Existing System and Need of System;

The Car Rental System is being developed for customers so that they can book their vehicles from any part of the world. This application takes information from the customers through filling their details. A customer being registered in the website has the facility to book a vehicle which he requires. The proposed system is completely integrated online systems. It automates manual procedure in an effective and efficient way. This automated system facilitates customer and provides to fill up the details according to their requirements. It includes type of vehicle they are trying to hire and location. The purpose of this system is to develop a web site for the people who can book their vehicles along with requirements from any part of the world.

1.3 Scope of the System:-

1. Saves time and cost
2. The rental system provides instant support to the customers
3. The rental system provides easy booking facility for the customers
4. It reduces the usage of paper as all the agreements, invoicing etc. can be done online.
5. The recurring invoices can be easily generated from the rental system.
6. The customers can make advance payments and bookings for the rentals.
7. The fleet can be easily managed, so the rental agency can easily identify what vehicles have gone out for rent and which are available for rent.
8. The payments and receipts made by the agency can be easily recorded using the rental system which gives the true financial position of the business.

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1.4 Description of Technology Used

Moving on, this car rental project system project in PHP focuses mainly on dealing with customers regarding their car rental hours and certain transactions. Also, it displays all the available cars on the home page where as the users cannot view unavailable cars until and unless the user returns the rental car. The project is divided into two categories: Customer Login and Employee Login. In an overview of this web app, the employee has full control of the system. Talking about the project, a customer can simply log in or register their accounts. He/she can view available cars, select any one and proceed for rental after selecting various conditions, dates, etc. After all, the customer can rent a car by filling up the given forms. The customer can view all his rental records and history once after logging onto the system. In addition, the customer needs to return the cars using the system because all the records are carried throughout the system. At last, the
system prints an invoice stating all the information with total costs.

Available Features:
- Customer Login/Register
- Employee Login/Register
- Display all available cars
- Various price range
- Rent cars
- View rental history
- Return cars
- Total amount calculations according to days and kms
- Add and view rental cars
- Add and list driver records
- View overall bookings
- Addition of extra charges (for crossing due dates)

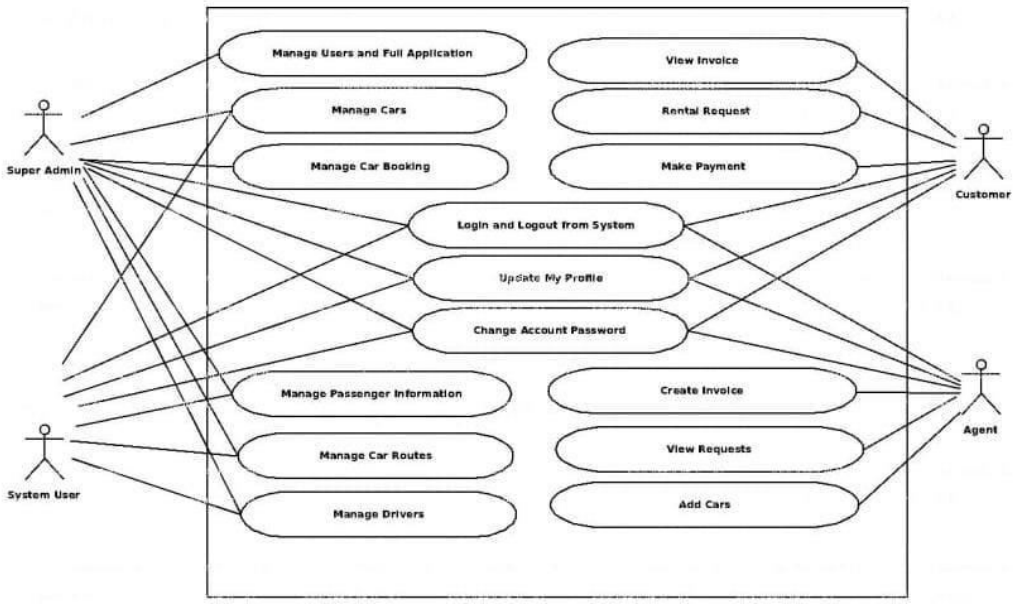

Figure 1: CAR RENTAL SYSTEM USING HYBRID APPROACH

II. LITERATURE REVIEW

literature review for Foodie Dine Dish - A Virtual Meal Ordering System:

Sujan Baniya et al. (2018). "Online Food Ordering Systems": This paper examines various online food ordering systems and their features, emphasizing the importance of user experience, menu customization, and efficient order management for success.

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Vaibhav Garg et al. (2019). "Mobile Applications for Online Food Ordering": Focusing on mobile platforms, this study explores the functionalities of food ordering apps, highlighting the significance of intuitive interfaces, real-time tracking, and secure payment gateways to enhance user engagement.
Adam Riley et al. (2020). "Emerging Trends in Virtual Restaurant Concepts": Investigating virtual restaurant models, this research discusses the rise of cloud kitchens and virtual brands, emphasizing the role of data analytics, strategic partnerships, and agile operations in optimizing customer satisfaction and profitability.

Yash Raj Gupta et al. (2019). "Customer Preferences and Satisfaction in Online Food Delivery: Addressing customer perspectives, this review examines factors influencing satisfaction in online food delivery, such as food quality, delivery time, pricing transparency, and personalized recommendations, suggesting strategies for service improvement and customer retention.

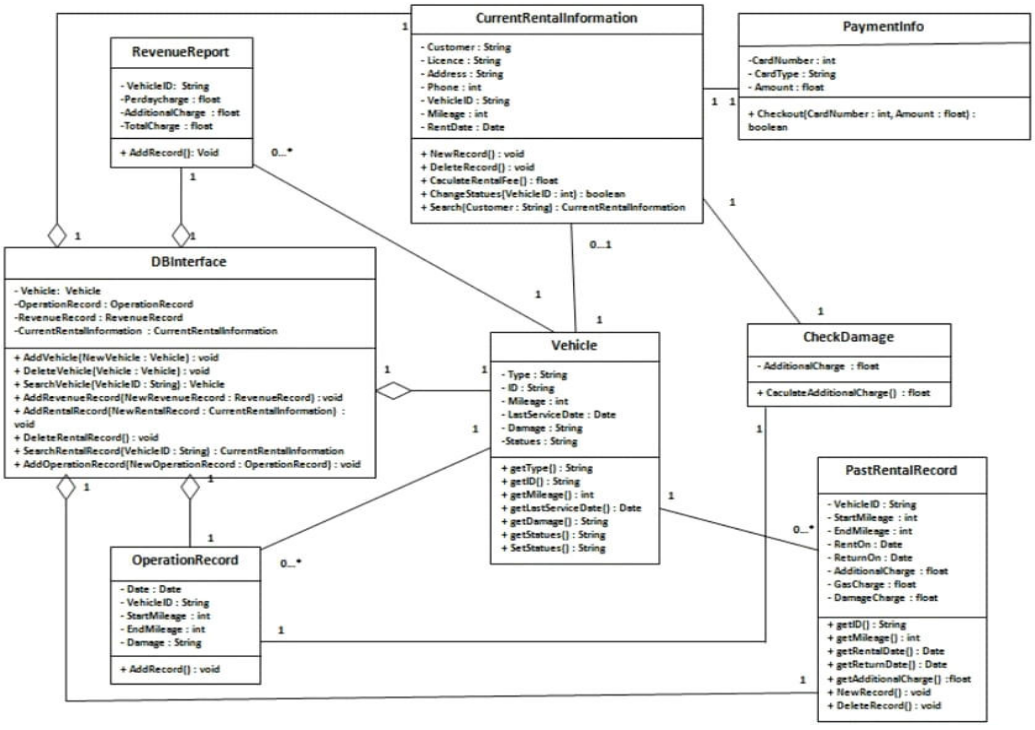
Emily Chen et al. (2017). "User Interface Design in E-Commerce Applications: This review analyzes principles of user interface design in e-commerce applications, emphasizing the importance of usability, accessibility, and visual appeal in enhancing user satisfaction and driving conversion rates.

Anna Lee et al. (2021). Digital Marketing Strategies for Food Delivery Platforms: Examining digital marketing tactics, this paper explores the effectiveness of social media campaigns, influencer partnerships, and targeted advertising in acquiring and retaining customers within the competitive online food delivery market.

III. OBJECTIVES

This research aims to develop the management of the information regarding item category, food, delivery address, order, and shopping cart is the system's primary goal. It oversees the management of all customer, shopping cart, and item category information. Since the project was entirely developed on the administrative end, only the administrator is assured access. The goal is to develop an application program to simplify managing the food consumer item category. It keeps note of every delivery address requested. Helping customers in placing meal orders whenever they want. Customers will be able to order their preferred foods at any time, but as we've already mentioned, this is only a limited option. As a result, restaurants need to have a specific system in place that will allow them to serve a large number of customers while streamlining operations.

IV. SYSTEM ARCHITECTURE AND DATA MODEL



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1.Customers: User goes to home page of the domain. If he/she has an account then he/she can login in restaurant management system otherwise he/she need to register an account after successful registration, they can login in home page.

2.Web Ordering System: Initially to visit the food categories or food menu, users don't need to login/register an account. After checking out the categories and menu items, if the user finds his/her desired menu and if they want to order that particular item they can go to order page. During placing any order the customer needs to provide his/her required information mentioned the order section.

3.Database: Through this food ordering website, customers may place orders from their computers, tablets, and cellphones. They can look through your menu options, choose what they want, and submit an order online. Internet-based payment will also be accepted. Meals can be picked up in person or delivered to customer.

4.Order Receive: Customer will receive the order with safe and perfection with time. It provides an efficient and convenient way for customers to purchase items online, allowing businesses to expand their customer base and increase sales. Customers have to physically visit restaurants to learn about food items and place their orders, which can be inconvenient and time-consuming. Ordering over the phone is also problematic, as customers lack a physical copy of the menu item and cannot confirm their order visually. Additionally, restaurants must hire employees to take orders and process payments, which can be costly and challenging in today's market, where labor rates are continually increasing.

5.Employees: Allows users to create accounts to save their preferences, order history, and payment information for future orders. The system adopts that consumers will be utilizing smartphones to place their orders. Once the consumer lands at the outlet, they can prove their preserved order completely by affecting their smartphone screen. The list of pre-picked articles will open or fan out on the room for cooking food screen, and upon ratification, an order slip will be impressed for further deal with. This answer facilitates the pre- order process for clients, making it a more nearby alternative.

6.Menu Management System: Our Menu will be called as "a map that encourages easy navigation between hunger and satisfaction." Mouthwatering restaurant menu descriptions can make your clients crave your offerings and happy patrons come back many times. Delicious meals are tasty, appetizing, scrumptious, yummy, luscious, delectable, mouth-watering, fit for a king, delightful, lovely, wonderful, pleasant, enjoyable, appealing, enchanting, charming and highly pleasant to the taste.

In summary, this solution architecture diagram outlines the various components and services involved in the VIRTUAL MEAL ORDERING system, illustrating the end-to-end process of the food ordering and delivery systems. From data collection and to provide the best facilities to the customer, each component plays a crucial role in ensuring efficient and reliable lending practices.

V. TESTING OF MODELS

Testing for the VIRTUAL MEAL ORDERING SYSTEM Solution Architecture:

1. Customers:

Test data collection functionality for Food orders.
Verify orders and the delivery management .

2. Web Ordering System:

Ubiquitous internet access and smartphone penetration facilitate easy access to online food delivery platforms.
Busy lifestyles and urbanization prompt consumers to opt for hassle-free meal solutions delivered to their doorsteps.

3. Database:

Test integration with hotel website APIs to fetch menu and services to the customer.
Verify the accuracy of order and the customer account.

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4. Order Receive:
Some types of online food ordering software allow you to take control of your delivery and pickup schedule with time slots, and order tracking
Ensuring food quality and freshness during transit remains a challenge for online food delivery services, leading to occasional customer dissatisfaction.

5. Employees:
Allows users to create accounts to save their preferences, order history, and payment information for future orders.
Compliance with food safety regulations and labor laws poses challenges for online food delivery platforms operating in multiple jurisdictions

6. Menu Management System:
Online food delivery offers unparalleled convenience, allowing consumers to order their favorite meals with a few clicks.
Online meal ordering systems substantially enhance order accuracy and customization, ensuring client pride. These systems empower diners to customize their orders precisely, catering to several selections and nutritional restrictions.
Throughout testing, ensure to cover various scenarios, including valid and invalid inputs, edge cases, and system failure scenarios. Additionally, conduct integration testing to verify the seamless interaction between different components and services within the SMART LENDER solution architecture.

VI. RESULT AND CONCLUSION

The implementation and testing of the VIRTUAL MEAL ORDERING system for the process consists of a customer choosing the restaurant of their choice, scanning the menu items, choosing an item, and finally choosing for pick-up or delivery.

Convenience and Time- Saving: Online food delivery offers unparalleled convenience, allowing consumers to order their favorite meals with a few clicks.
Expanding Digital Infrastructure: Ubiquitous internet access and smartphone penetration facilitate easy access to online food delivery platforms.

Changing Lifestyle Patterns: Busy lifestyles and urbanization prompt consumers to opt for hassle-free meal solutions delivered to their doorsteps.

High Commission Fees: Restaurants face pressure from high commission fees charged by online delivery platforms, impacting profit margins.

Quality Control Challenges: Ensuring food quality and freshness during transit remains a challenge for online food delivery services, leading to occasional customer dissatisfaction.

Enhanced Customer Convenience: Online food ordering systems significantly enhance consumer comfort, providing a continuing and efficient manner for customers to enjoy their preferred food.

Regulatory Compliance: Compliance with food safety regulations and labor laws poses challenges for online food delivery platforms operating in multiple jurisdictions.

Order Accuracy and Customization: Online meal ordering systems substantially enhance order accuracy and customization, ensuring client pride. These systems empower diners to customize their orders precisely, catering to several selections and nutritional restrictions.

In conclusion, the VIRTUAL MEAL ORDERING system represents a significant advancement in the field of online food delivery systems. By harnessing the power of machine learning, data analytics, and automation, VIRTAL MEAL ORDEING SYSTEM offers lending institutions a sophisticated tool for optimizing food ordering process.

Through accurate creditworthiness prediction, improved risk management, and enhanced customer experience, VIRTUAL MEAL ORDERING SYSTEM enables lending institutions to make informed, efficient, and equitable food

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order and delivery. The system not only enhances operational efficiency but also contributes to the financial stability and sustainaility of lending practices.

Moving forward, continual monitoring, refinement, and integration of feedback will be essential to further enhance the effectiveness and reliability of VIRTUAL MEAL ORDERING SYSTEM. Additionally, ongoing research and development efforts should focus on addressing emerging challenges and evolving regulatory requirements in the dynamic landscape of Food Services .

In summary, VIRTUAL MEAL ORDERING SYSTEM represents a transformative solution for online food order and delivery facilities, paving the way for more efficient, data-driven, and responsible lending practices in the Food industry.

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